



REVISED EDITION.

Published and Presented by

SPEAR & JACKSON LTD.,
SHEFFIELD, ENGLAND.

“SPEARIOR”
SAWS
ARE
SUPERIOR
TO
ALL
OTHERS.

Henry Fleet

CONCERNING HANDSAWS

Published and Presented by

SPEAR & JACKSON
LIMITED,

**ÆTNA WORKS,
SHEFFIELD,**

England.

1928.

Fifth Edition.

Copyright.

AGENTS—

INTRODUCTION.

AS makers of Handsaws of the very highest quality for more than a century and a half, the firm, which came into existence in the 18th Century as Love & Spear, and is now Spear & Jackson Ltd., have compiled this booklet with the aim and object of placing at the disposal of Saw users certain knowledge which is based upon their long manufacturing experience and study of their products in the hands of the user.

A careful study of the pages which follow should assist the user to choose the right saw and to keep it in such a condition that it will give him full satisfaction in working.

Ætna Works, Sheffield,
1928.

Setting and Sharpening.

The Operations must be done in the following order:—

- | | |
|--------------|------------------|
| (1) Topping. | (3) Side Filing. |
| (2) Setting. | (4) Sharpening. |

TOPPING.

This is the operation of reducing points of all teeth to same height (also called breasting or jointing) (See Fig. 1.)

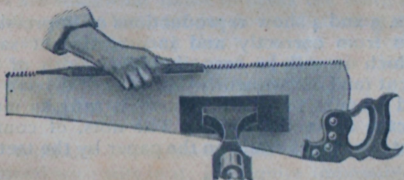


Fig. 1.

Run the file backwards and forwards from end to end of the saw until every tooth is touched with the file.

A fairly smooth cut or well used file should be used, preferably not less than 10 in. long. If a new file is bought for the purpose get a "millsaw" file, 10 in. or 12 in. second cut.

Then go over the saw from end to end with a taper file, filing each tooth straight through (taking no regard for the bevel), your sole object being to sharpen again each tooth which has been flattened in topping.

Handsaws should of course be topped every time they are sharpened. The saw is now ready for setting.

SETTING.

Width of Set.—When a new saw is purchased an impression should be taken of the teeth on a piece of paper and carefully preserved for future guidance. (See Fig. 2.)

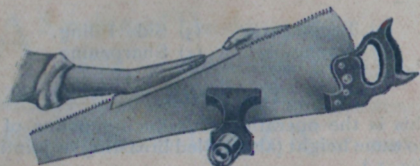


Fig. 2.

Figs. 3 and 4 show reproductions of impressions so taken from correctly and incorrectly set saws, from which it will be seen that the width of the groove cut (and consequently the effort of driving the saw and amount of wood wasted) is *twice* as much in one case as in the other. The dots, of course, represent the marks made on the paper by the teeth.

Fig. 3.

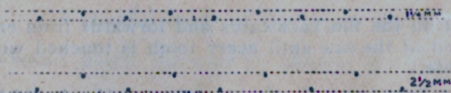


Fig. 4.

In these days of finely taper-ground saws a *very* small amount of set is sufficient.

Ninety per cent of the saws sent to us for repair have been set far too wide.

Saws often bind, not because they have not enough set, but because they are badly sharpened and do not cut a clean groove.

The Depth of Set.—The set should *never* extend more than *halfway down* the tooth. If teeth are set right down to the bottom, as is so often the case, it distorts the plate and so may cause cracks. When a new saw is purchased the depth of the set should be carefully noticed and exactly imitated when the teeth are being re-set.

The Method of Setting.—The best way of setting a handsaw is with a *hammer and anvil*, which is the method used by all manufacturers.

Plier saw sets when used on highly tempered saws are somewhat liable to break the teeth out, and usually set the teeth too far down, distorting the plate. The screws adjusting them are apt to work loose, giving wider set at one end of the saw than at the other.

With the old-fashioned saw set, made of a piece of metal with slits in it, it is quite impossible to get an even set, and those are still more liable to break out the teeth than the plier sets.

A highly tempered saw should be set with two or three blows of the hammer on each tooth, and is apt to break in attempting to set with one blow only. We set our saws with one blow only, to give them a severe test, and the fact that they have been so set by us proves that no tooth will break out afterwards if set by two or three blows. *The harder a saw the better, as the more rarely it requires setting and sharpening.*

If your saw teeth break be careful to see that your setting tool is correctly adjusted; remember the saw teeth did not break when set in the factory.

SIDE FILING.

This is performed by running a file lightly down both sides of the teeth to level up any irregularity in the setting, having first placed the saw perfectly flat on the bench. (See Fig. 5.)

Saws must be side filed every time they are set. The saw is now ready for sharpening.



Fig. 5.

SHARPENING.

General.—The file must work on the front edge of the teeth set away from you and at the same time on the back of the teeth set towards you (Fig. 6), so that only the alternate teeth can be filed from one side, and the saw must then be turned and completed.

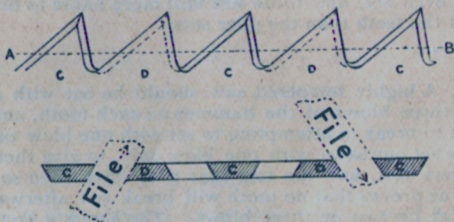


Fig. 6.

The arrows indicate the direction of point of file.

In considering the above illustration it must be supposed that the teeth *CCDD*, are cut off along the line *AB* (top sketch), and then looked at from a point directly above them (lower sketch.)

This operation is much easier to perform properly if the right size of taper file is used, as below :—

Points to inch	3½	4	4½	5	5½	6	6½	7	8	9	10	11	12
Size of File...	9	8	8	7	7	6	5½	5	5	4½	4	4	in

For Backsaws use slim taper saw files, 3 in. or 3½ in.



Fig. 7.

Cross-cut Handsaws for general purposes and for soft wood should have a considerable bevel on the tooth (see Fig. 7), to obtain which the file must be held in sharpening at an angle of about 45° to the

plane of the saw (Fig. 6), but the file itself must be horizontal, not tilted up or down. In cross-cut saws for hard-wood, the bevel should be slightly less acute, the file being at an angle of, say 60°, with the plane on the plate, or better still, grind the teeth



Fig. 8.

off one side (but not off the edge) of the file and continue to use at 45°, so that the smooth side rests on the back of the tooth, and the face only is bevelled with the full amount of bevel. (See Fig. 8).

Care must be taken to hold the file at the same angle to the plate for each tooth, or the teeth soon get irregular and will not cut true. Special care must be taken to work at the same angle, when the saw is reversed, as this is a common error, causing big and little teeth, and leaving the points on one side higher than the other, resulting in the saw refusing to cut in a straight line. Give the same number of uniform strokes to each tooth.

Ripsaws should be filed straight across (no bevel), but only alternate teeth should be sharpened from one side, and then the saw reversed as in the case of cross-cuts.

After sharpening, run a long flat whetstone down the sides of the saw, as in side filing, to take off the fash.

The Action, Shape, and Bevel of Saw Teeth.

These points, apparently little considered by joiners, are important, because the intelligent carrying out of the above instructions depend on the understanding of the principles.

Firstly, it must be remembered that wood is made up of a series of threads or fibres, all running in one direction, and that on this account the action of the saw teeth is quite different when sawing across or along the grain.



Fig. 9.

Cross-cutting.—Each fibre is severed, first on one side of the groove by one tooth, then on the other by the next, the ridge left between them crumbling away and being carried out as sawdust by the subsequent teeth (Fig. 9).

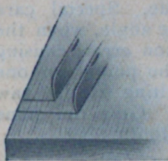


Fig. 10.

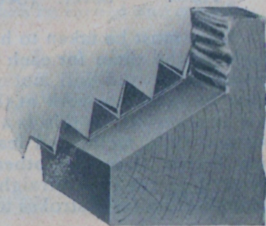


Fig. 11.

The action of the teeth, therefore, is that of a series of small knives (Figs. 10 and 11), and it is obvious that a good bevel on the front, or cutting edge is necessary, and that this cutting edge should be inclined to the line of cut, so that the teeth may score deeply and easily into the wood.

Ripping.—In this case the action of the teeth is more like that of a series of planes than of knives, each tooth cutting out a shaving the full width of its edge and carrying this out of the groove in front of it (Figs. 12 and 13).



Fig. 12.

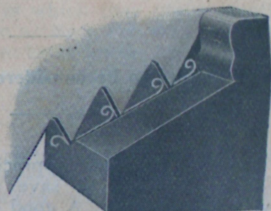


Fig. 13.

Therefore the cutting edge in this case is not inclined at an acute angle to the line of cut, but is at right angles to it, and a broad chisel edge rather than a needle point is required, so that the teeth are filed straight across, not making a bevel on either the front or the back of the tooth.

Hard Woods.—In the case of hard woods the above remarks and sketches must be modified somewhat, as below, though the same principles apply.

In cross-cutting, the ridge made between the teeth does not crumble out so readily as in soft woods, and therefore a smaller bevel should be used, thus making a smaller ridge.

In ripping, the shavings do not so readily split away from the sides of the groove, so that a small bevel (on the face of the tooth only) is advisable to give a slight ridge, similar to that made in cross-cutting.

Cross-cut saws will rip more easily than Ripsaws will cross-cut.

Choosing a Handsaw.

Points to be considered in advance.

Every Carpenter appreciates a good tool—It is false economy to save a shilling or so by buying a poor saw. A good one will pay for itself, not only in the time and labour saved in use and in keeping it in order, but also by the fact that it will last longer.

The points to consider are as follows (in order of importance) :—

- (1) A first-class blade of the very best steel possible, highly tempered and taper-ground.
- (2) A sound tough handle, well-fitted.
- (3) Finish, workmanship, balance, &c.

The Steel can only be tested by actual use, and the only way to protect yourself in this respect is to buy a saw by an absolutely first-class maker, and which is fully guaranteed.

Spear & Jackson's "Special Vanadium Alloy" and "Silver" Steels are the result of a constant endeavour to make the best, repeated experiments, and an experience of 150 years.

Sheffield Saw Steel is still superior to any other.

Temper.—The hardening and tempering of saws is probably the most important of all operations of manufacture. Large sums have been spent at Ætna Works in research on these important processes, with the result that the temper of Spear & Jackson's saws is one of the features in which they pre-eminently excel. Spear & Jackson's "New Process" saws are guaranteed tough without being brittle, and to maintain their edge the maximum length of time without resharpening.

Grinding.—Special care is taken in the grinding of S. & J. saws. By our method the saw is given a uniform taper from tooth to back, leaving the tooth edge an even thickness throughout and stiff at the handle, whilst the blade tapers to the point. This enables you to work our saws with the minimum amount of set and exertion.

The Handle must be free from knots, &c. The handle is a great point in favour of the English saw against the American, **English** beech being superior to any other wood in existence for saw handles, being extraordinarily tough and sound in grain. American beech wood is used, but it grows much more rapidly than English, and consequently is inferior. American applewood, though often handsome in appearance, is brittle, and liable to crack. We recommend English beech every time as the best wood to be got for saw handles, regardless of cost. Spear & Jackson have their own steaming and natural drying yards and no handles are made except from thoroughly seasoned wood.

Finish, Workmanship, &c.—If you take a pride in your tools choose a nicely finished saw—a special feature of the S. & J. brands (e.g., the beautiful etching on the blade). Our special mirror polish is of practical utility, as the smoother the surface of steel, the less the liability to rust.

How to test a Saw in the Shop.

- (1) Spring the blade (holding handle in right hand), to see if it bends in a regular curve and goes back straight on release. (See Fig. 14).

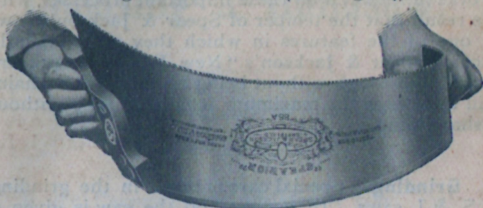


Fig. 14.

- (2) To test taper grinding, try with a wire gauge (borrowed from tool dealer) to find if well and regularly tapered from point to handle along the back, and of same gauge throughout along the teeth. Fig. 15 indicates how a medium thick plate should show with the gauge.

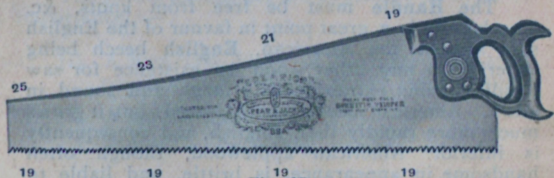


Fig. 15.

- (3) Don't choose too thick a blade. The thinner a well ground saw which will stand up to its work, the better ; it takes less driving and cuts less kerf.
- (4) See that it balances well and feels comfortable when held in position for working. Special care is taken in this respect with S. & J. saws.
- (5) See that the handle is not loose, that it fits the hand well, and is of good seasoned wood of good grain. (All our wood is seasoned for at least three years before use.)
- (6) See that the saw is evenly set and sharpened to a fine point.

Choosing size of teeth required.

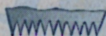
The best size of tooth depends entirely on the hardness of wood to be cut. In soft wood each tooth cuts deeply, and therefore a large gullet or space between the teeth is required to carry out the saw-dust. In a very hard wood very little dust is made by each tooth, and therefore a saw with smaller and more numerous teeth should be chosen. Generally speaking the following are suitable:—

Rip Saws.— $3\frac{1}{2}$ pts. for soft open grain wood.
4 pts. for harder woods.

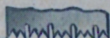
Cross-cut Saws.—

$5\frac{1}{2}$ to $6\frac{1}{2}$ pts. for general use.
7 and 8 pts. for hard woods.
10 pts. for cabinet work.
12 pts. for special fine work, and where the smooth cut is required.

For soft wet timber extra course teeth (4 and $4\frac{1}{2}$ pts.) are used, or special "fleam" teeth, as shown.



For green wood the "lightning" tooth (or special "farmer's" tooth) is the best.



The size of saw teeth is measured by the number of "points to the inch," inclusive of both outside teeth, thus:—



5 points 1 inch.

$6\frac{1}{2}$ points 1 inch

The number of points to the inch is stamped on the heel of each saw.

Choosing a Back Saw.

See General Remarks on Choosing Handsaws.

Look at the end of the saw to see that the blade and back are in a perfectly straight line, and not twisted, as in Fig. 16 (a very common fault.)



Fig. 16

Look down the teeth to see that the blade is perfectly straight.

Choose a saw in which the back will not come away from the handle (as in Fig. 17). This is always liable to happen and the saw plate to become twisted and utterly spoiled unless prevented, as in S. & J.'s. Back Saw No. 260 (see Fig. 18), where the brass pin passes securely through back, blade and handle.



Fig. 17.

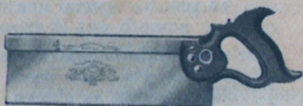


Fig. 18.

Care of Back Saws.—Great care should be taken not to drop back saws or throw them about, as the thin plate is very easily put out of truth in this way. Therefore, if on looking down the teeth of

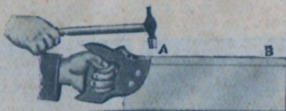


Fig. 19.

your saw you see that the blade is not straight, don't jump to the conclusion that the saw is necessarily a bad one, and abuse the makers. You can generally

put it right by placing the saw on a piece of wood and giving the back one gentle tap with a hammer at each of the points *A* and *B* (see illustration).

If this doesn't do the trick it means that you have got the plate twisted, and in this case you cannot put it right yourself, and should send the saw at once to be repaired.

General.



Fig. 20.

(1) **Tension on Handsaws**—Many joiners do not know that in addition to a saw being hammered to make it flat, it is also hammered so that the centre of the blade is slightly expanded, and always pulling at the toothed edge to keep it taut and true. The condition of the saw is like that of a piece of paper held as shown in Fig. 20, the toothed edge being stretched tight, the body of the saw "loose."



Fig. 21.

(2) **Bead.**—We are frequently asked what is the purpose of the bead on straight back handsaws, so that it may be of interest to state that this is merely ornamental. (Fig. 21).

(3) **To remove rust**, apply a little paraffin to the rusty places and rub lightly with fine emery cloth.

(4) **A good well-ground saw does not require oil**, but after using hang up in a dry room with a thin coat of vaseline or "Steelbrite."

Never use bacon rind or salty grease.

An Inexpensive

Home Made Saw Vice.

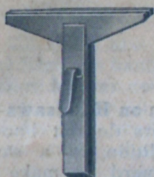


Fig. A.

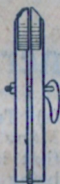


Fig. B.



Fig. C.

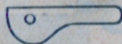


Fig. D.

Fig. A shows the vice complete; Fig. B a side section; Fig. C the lever, and Fig. D the lever on iron staple.

The vice is made throughout from some wood, 3 in. wide $\times$ 1 in. thick; the jaws are 12 in. long and the uprights 14 in. The staple is made from $\frac{1}{4}$ in. round iron bar, and is tapped to take the two nuts. Any smith will supply the bar and bend and tap it for you. The hinge at the bottom of the uprights is an ordinary 2 in. butt hinge. Pieces of leather or vulcanised rubber fastened inside the jaws will make the vice grip better.

As will be seen from the illustration (Fig. C), the lever is eccentric in shape, so that when it is raised the jaws of the vice open sufficiently to admit the saw blade easily, whilst by forcing the lever into position shown in Figs. A and B, the jaws are made to grip the saw tightly.

The World's Best Saw.



No. 171A.

Vanadium Steel Saws, "Double Mermaid" Brand, skew back.. The best it is possible to make, regardless of cost.

These saws are left very high in temper, and require sharpening less frequently than any others made; great care however, must be taken in setting.

Extra taper-ground will work with the smallest possible amount of set. Our new process makes these saws stand severer strains without buckling than any others.

STANDARD SIZES OF TEETH:

20"	22"	24"	26"	28"
10, 12	10, 12	7, 8	5½, 6, 6½, 7	3¾, 4 points to inch.

Through Ironmongers and Tool Dealers only

"Spearior Temper" Handsaws.



No. 88A.

Silver Steel Saws, "Mermaid Brand"—

Our standard line, made from an improved quality crucible steel, ground thin to back. Rapidly becoming the most popular high grade saw on the market.

No. 88a, as shown, hollow back, improved temper, best English beech handles, raised brass screws.



No. 82.—Special Alloy Cast Steel, Special Polish.

Std. Size	20"	22"	24"	26"
Std. Pts.	10-12	10-12	6, 7, 8	5, 5½, 6, 6½, 7, 8
	26" Rip.		28" Rip.	
	4		3½, 4 per inch.	

Through Ironmongers and Tool Dealers only.

“Improved Temper” Handsaws.



No. 25.

Warranted Cast-steel saws, “Leapfrog” Brand, made from crucible steel, and bearing our full warranty.

No. 25, as shown, hollow back, taper ground, improved temper, highly polished, selected English beech handle, raised brass screws.

Std. Size	20"	22"	24"	26"
Std. Pts.	10-12	10-12	6, 7, 8	5, 5½, 6, 6½, 7, 8
	26" Rip		28" Rip.	
	4		3½, 4 per inch.	



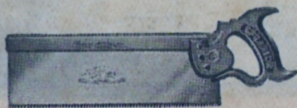
No. 24.

Same quality and finish as No. 25, but *straight* back.

Std. Size	20"	22"	24"
Std. Pts.	10-12	8, 10, 11, 12	5, 5½, 6, 7, 8
	26"	26" Half-Rip	28" Rip.
	4½, 5, 5½, 6, 6½, 7	4, 4½	3½, 4 per inch.

Through Ironmongers and Tool Dealers only.

Back Saws, &c.



Extra Cast-steel Back Saws, "Mermaid" Brand, special finish, handled by S. & J.'s improved method. (See page 14).

No. 260, bright steel back.

No. 266, brass back.

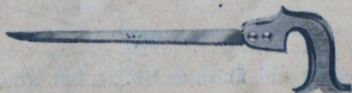


No. 52.

Warranted Cast-steel Back Saws, "Leapfrog" Brand, similar in quality and finish to Handsaws Nos. 25 and 24.

No. 52, brass back.

No. 46, bright steel back.



Compass or Lock Saws, also Table Saws, Pruning Saws, Fret-Saws, &c., all of extra cast steel, and bearing our full warranty.

Through Ironmongers and Tool Dealers only.

Sets of Saws.



Interchangeable sets of saws. Can be had with three or four blades, the fourth being a special plumber's blade, ground to run without set, and sharpened to cut through metal tubes, pipes, nails, &c., in addition to cutting wood in the ordinary way.

No. 280—Complete with four blades.

No. 269—With three blades only.

All parts as shown may be obtained separately.

WARRANTY.



Through Ironmongers and Tool Dealers only.

NEW
SPEARIOR

**SAWGUARD FOR
HANDSAWS**



This guard is supplied
correct length for 26 in.
saws—for shorter saws
cut a piece off one end
and move position of
one clip.

Made from polished hardwood. Can be removed from
the saw with ease. Grips the saw firmly and absolutely
protects the teeth from damage.

Made only by

**SPEAR & JACKSON LTD.,
SHEFFIELD.**